

**Remarks**

Claims 1-16 are canceled. New Claims 17-36 are submitted. Claims 17-36 are pending, of which Claim 17 is the sole independent claim.

Each of the Examiner's objections or rejections is addressed below in the order they were presented in the Office Action.

**Rejection Pursuant to 35 U.S.C. § 112, Second Paragraph**

The undersigned appreciates the Examiner's suggestion of an amendment to Claim 9. The suggested amendment appears in new claim 17 section (b) that recites, in part, "to enhance wetting of the nonwoven web by the layer of hydraulic cementitious material, and adhesion of the nonwoven web to the layer of hydraulic cementitious material, and continuity of the layer of hydraulic cementitious material about the reinforcement fabric."

Claim 9 was further rejected under 35 USC 112, second paragraph, for having a recital pertaining to "the need". Applicant has decided to cancel Claim 9. Applicant's new claims are written without having the recital to which the rejection was applied.

The undersigned appreciates the Examiner's suggestion of an amendment to Claim 15. Applicant has decided to cancel Claim 15. Applicant's new claims are written without having the recital for which the amendment was suggested.

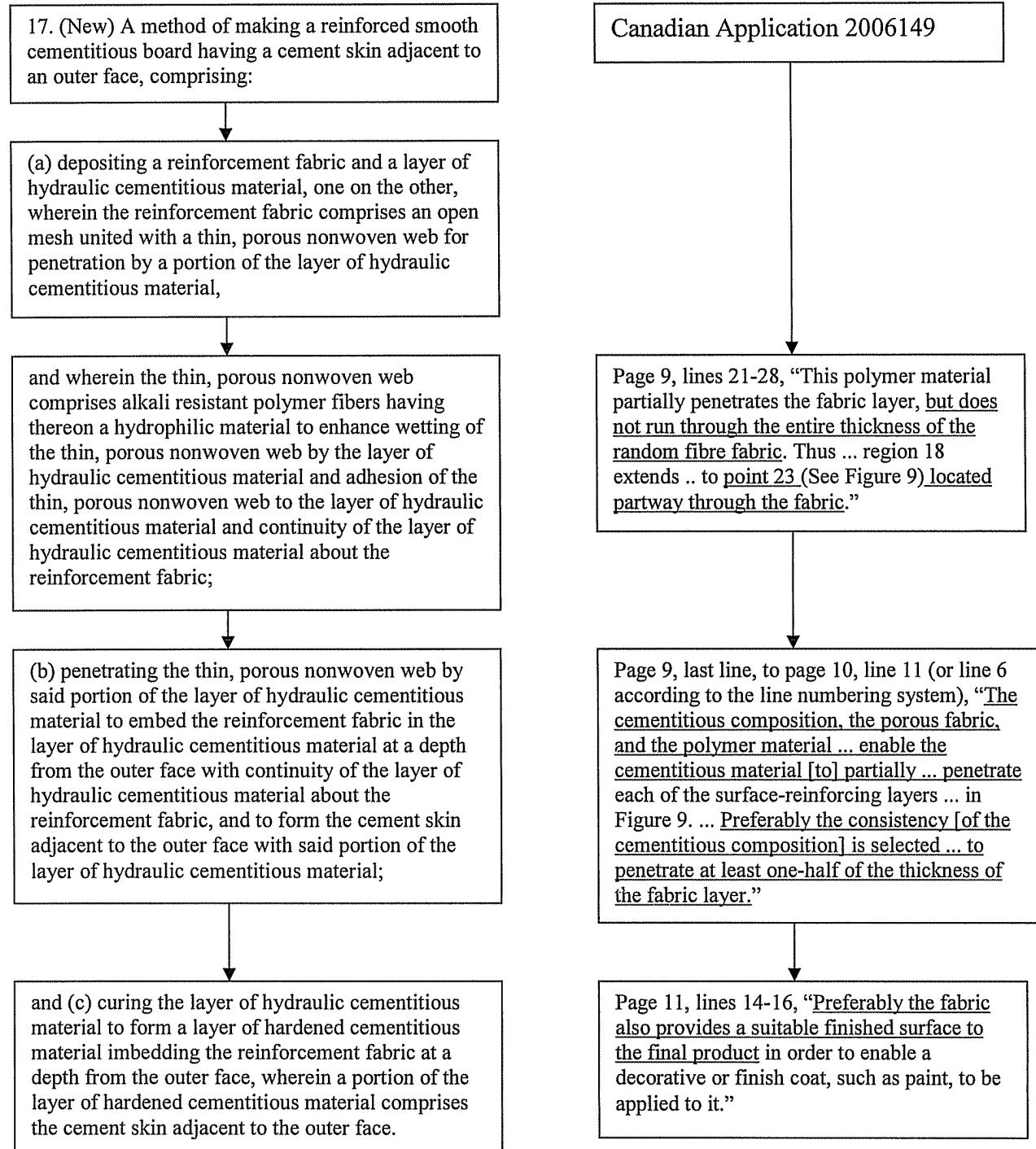
**Rejection Pursuant to 35 U.S.C. § 103(a) Over Canada (CA 2006149) in view of Riley et al. (US 3,903,879), Newman et al. (US 6054205), UK Great Britain (GB 2023687) and Shah et al. (US 5891374).**

To avoid the rejection, the preamble of Applicant's new claim 17 recites a cementitious board having a cement skin adjacent to an outer face, which has antecedent basis in paragraph [0021]. The cement skin adjacent to the outer face is further recited in the body of claim 17 sections (b) and (c) in a new combination of a cement skin adjacent to an outer face and a reinforcement fabric embedded at a depth from the outer face. The Canadian application at page

11, lines 14-16 states, “Preferably the fabric also provides a suitable finished surface to the final product in order to enable a decorative or finish coat, such as paint, to be applied to it.”

(Accordingly, the Canadian application teaches that a finished surface is provided on the fabric, which differs from the combination of a cement skin adjacent to an outer face and a reinforcement fabric at a depth from the outer face.) Newman et al. discloses at column 2, lines 9-20, “The glass fiber facing sheet provides a smooth surface which is essentially free of pitting.” The published UK patent application discloses, at page 3, lines 27 et seq., “Since (nonwoven) layer 4 on the side towards the fabric layer 2, 3 or the plaster core has a larger pore size than on its outwardly facing surface, the flowable, water-containing plaster mash can penetrate relatively far into the layer 4. The extent of penetration is indicated by the lines 6 and 6’ in the drawing.” (Accordingly, lines 6 and 6’ are within the nonwoven layer 4, such that the UK published application does not disclose a plaster mash providing a cement skin adjacent to the outer face on nonwoven layer 4. Instead, the surface of the board is provided on the nonwoven layer 4.) Thus, Newman et al. and the Canadian application and the UK application do not combine to teach a cement skin, when each singly and all in combination teach that a smooth surface is provided on a corresponding fabric, facing sheet or nonwoven layer.

Flow diagrams are submitted to compare and contrast Applicant’s claim 17 with the Canadian application, Newman et al. and the UK GB application, respectively.



17. (New) A method of making a reinforced smooth cementitious board having a cement skin adjacent to an outer face, comprising:

(a) depositing a reinforcement fabric and a layer of hydraulic cementitious material, one on the other, wherein the reinforcement fabric comprises an open mesh united with a thin, porous nonwoven web for penetration by a portion of the layer of hydraulic cementitious material,

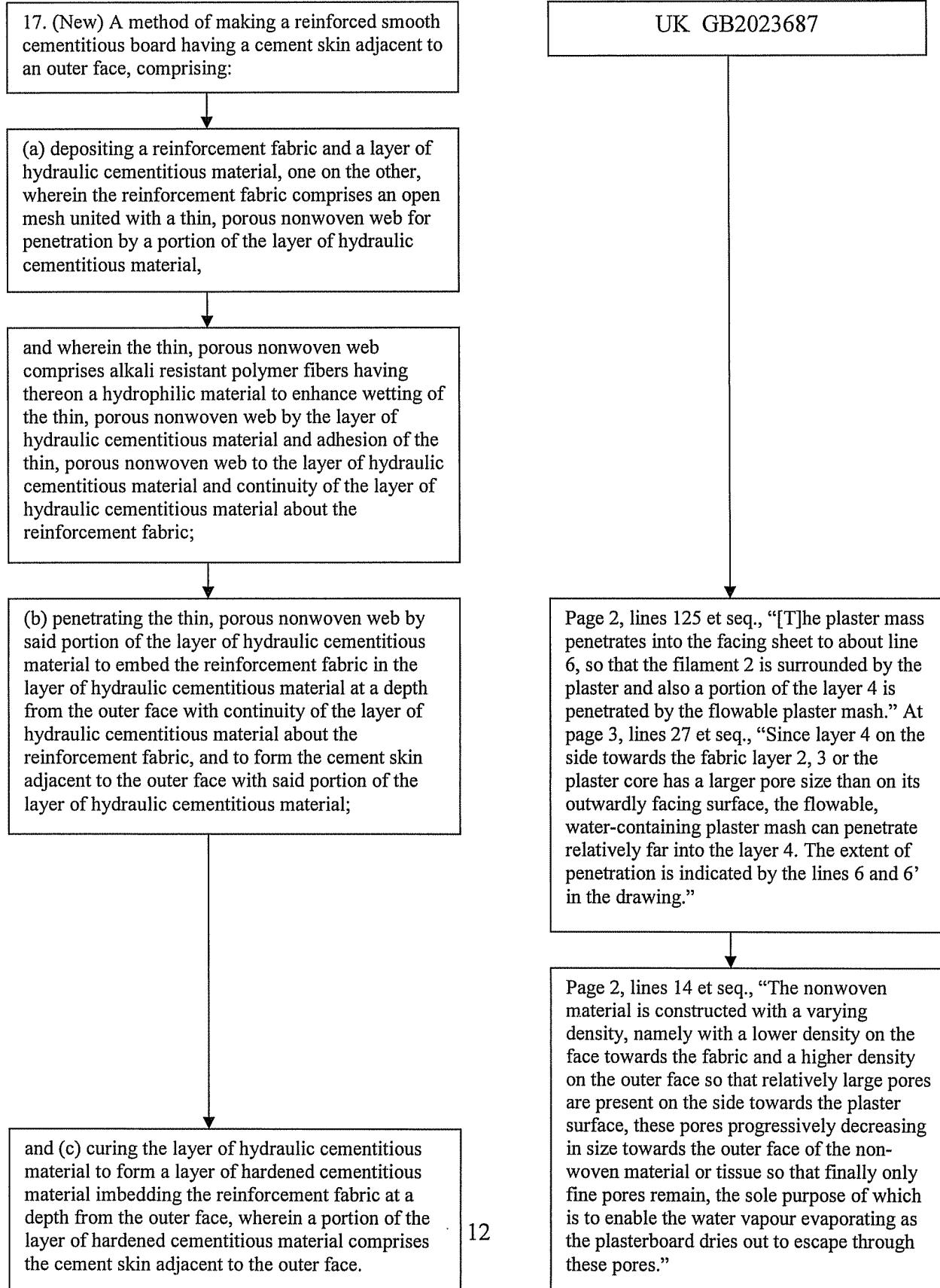
and wherein the thin, porous nonwoven web comprises alkali resistant polymer fibers having thereon a hydrophilic material to enhance wetting of the thin, porous nonwoven web by the layer of hydraulic cementitious material and adhesion of the thin, porous nonwoven web to the layer of hydraulic cementitious material and continuity of the layer of hydraulic cementitious material about the reinforcement fabric;

(b) penetrating the thin, porous nonwoven web by said portion of the layer of hydraulic cementitious material to embed the reinforcement fabric in the layer of hydraulic cementitious material at a depth from the outer face with continuity of the layer of hydraulic cementitious material about the reinforcement fabric, and to form the cement skin adjacent to the outer face with said portion of the layer of hydraulic cementitious material;

and (c) curing the layer of hydraulic cementitious material to form a layer of hardened cementitious material imbedding the reinforcement fabric at a depth from the outer face, wherein a portion of the layer of hardened cementitious material comprises the cement skin adjacent to the outer face.

Newman et al.

Fig. 6, and column 9, lines 13-14 “a first cementitious slurry 76 is provided from a first mixer 78 and deposited ...”. Further, at column 9, lines 28-29, “As shown in FIG. 6, the glass fiber facing sheet 10 of the invention can be supplied from a roll 70... “. [it is noted that the first cementitious slurry 76 is under the glass fiber facing sheet 10]. At column 9, line 35, “The glass fiber facing sheet 10 is then applied to the cementitious slurry 76.” An additional mixer 90 can be used to apply a low viscosity slurry 91 to facing sheet 10.” The significance of Newman et al. is that such slurry 91 over the facing sheet 10 is different from the cementitious slurry 76 under the facing sheet 10.



Applicant's claim 17 recites at section (a) depositing a reinforcement fabric and a layer of hydraulic cementitious material one on the other. An antecedent basis is provided in paragraph [0039].

Applicant's claim 17 recites at section (a) an open mesh united with a thin, porous nonwoven web for penetration by a portion of the layer of hydraulic cementitious material. An antecedent basis is provided in paragraphs [0030] and [0035].

Further, Applicant's claim 17 recites at section (a) wherein the thin, porous nonwoven web comprises alkali resistant polymer fibers having thereon a hydrophilic material to enhance wetting of the nonwoven web by the layer of hydraulic cementitious material and adhesion of the nonwoven web to the layer of hydraulic cementitious material and continuity of the layer of hydraulic cementitious material about the reinforcement fabric. An antecedent basis is provided in paragraphs [0032] and [0034].

Applicant's claim 17 recites at section (b) penetrating the thin, porous nonwoven web by said portion of the layer of hydraulic cementitious material to embed the reinforcement fabric in the layer of hydraulic cementitious material at a depth from the outer face with continuity of the layer of hydraulic cementitious material about the reinforcement fabric, and to form the cement skin adjacent to the outer face with said portion of the layer of hydraulic cementitious material. An antecedent basis is provided in paragraphs [0009], [0021], [0038] and [0039].

The rejection at page 4, last 3 lines, cites Canadian published application 2006149, which discloses, "The sprayed polymer (e.g. sprayed acrylic resin) functions, therefore, as a wetting agent and enhances adhesion of fabric to an alkali cementitious matrix." However, the Canadian published application 2006149 at page 13, lines 9-14 further states, "The amount of polymer is sufficient to cover the fibrous layer completely while at the same time ...to penetrate the fabric or paper layer but ... not that it runs through the entire thickness of the layer." Further, at page 9, lines 21-28, "This polymer material partially penetrates the fabric layer, which preferably comprises finer layers of random fibers, but does not run through the entire thickness of the random fibre fabric. Thus ... region 18 extends from the inner surface of each [fabric] layer 14

and 16 outwardly to point 23 (See Figure 9) located partway through the fabric.” Further, at page 9, last line, to page 10, line 11 (or line 6 according to the line numbering system), “The cementitious composition, the porous fabric, and the polymer material ... enable the cementitious material [to] partially ... penetrate each of the surface-reinforcing layers [bottom reinforcing layer and top reinforcing layer, respectively] in the manner illustrated in Figure 9. ... Preferably the consistency [of the cementitious composition] is selected ... to penetrate at least one-half of the thickness of the fabric layer.” [In viewing Fig. 9, below the fabric layer 14, a further structure is shown, but is unnumbered. It is most likely such further structure corresponds to the form 20 shown also in Fig. 3].

Further, the Canadian application states at page 16, lines 8-18, “[T]he coated surface, indicated at 48 in Figure 7 .. helps the cementitious composition to penetrate partially the sheet 36. ... Again the preferred extent of the penetration is at least half the thickness of the sheet 16. This penetration creates a strong, integral bond between the central core and the reinforcing sheet 36.” The Canadian application at page 11, lines 14-16 states, “Preferably the fabric also provides a suitable finished surface to the final product in order to enable a decorative or finish coat, such as paint, to be applied to it.” Thus, the Canadian application does not teach a cementitious composition to form a skin adjacent to the outer face and to imbed the reinforcement fabric at a depth from the outer face.

The rejection points out that page 18 of the Canadian application discloses that instead of a single layer of surface-reinforcing fabric, several layers one on top of another can be used. The Canadian application states that the layers can be adhered together by the cementitious coating and/or polymer coatings. However, the only outer face disclosed by the Canadian application is on a fabric when one layer of fabric is used. The Canadian application at page 11, lines 14-16 states, “Preferably the fabric also provides a suitable finished surface to the final product in order to enable a decorative or finish coat, such as paint, to be applied to it.” Similarly, when several layers of fabric are used, surely the outermost one of these fabric layers can be the outer face disclosed by the Canadian application as being on a fabric. Thus, the Canadian application does

not establish, necessarily or inherently, that the several fabric layers adhered together by the cementitious coating and/or polymer coatings result in a combination of a cement skin adjacent to the outer face, and a reinforcement fabric embedded at a depth from the outer face.

Accordingly, the Canadian application does not provide a teaching to combine with Newman et al. to suggest Applicant's claim recital of, penetrating the reinforcement fabric with some of said layer of hydraulic cementitious material for some of said layer of hydraulic cementitious material to comprise the cement skin adjacent to the outer face and to imbed the reinforcement fabric in said layer of hydraulic cementitious material at a depth from the outer face.

Newman et al. discloses in Fig. 6, and column 9, lines 13-14 "a first cementitious slurry 76 is provided from a first mixer 78 and deposited ...". Further, at column 9, lines 28-29, "As shown in FIG. 6, the glass fiber facing sheet 10 of the invention can be supplied from a roll 70... [it is noted that the first cementitious slurry 76 is under the glass fiber facing sheet 10]. At column 9, line 35, "The glass fiber facing sheet 10 is then applied to the cementitious slurry 76." An additional mixer 90 can be used to apply a low viscosity slurry 91 to facing sheet 10." The significance of Newman et al. is that such slurry 91 over the facing sheet 10 is different from the cementitious slurry 76 under the facing sheet 10. By contrast, Applicant's claim 17 (b) recites penetrating the reinforcement fabric by said portion of the layer of hydraulic cementitious material for said portion of the layer of hydraulic cementitious material embed the reinforcement fabric in the layer of hydraulic cementitious material at a depth from the outer face, and to form the cement skin adjacent to the outer face.

Further, Newman et al. discloses, at column 7, lines 12-44, the embodiments of Figs. 1-3 comprise a microporous layer or film 220 that provides a water resistant surface (see line 24). The water resistant surface would be impenetrable by hydraulic cementitious material. Accordingly, because of the water resistant surface, Newman et al. needs a first slurry 76 to one side of the water resistant surface, and a second slurry 91 to the other side, second side, of the water resistant surface.

As a further consideration of Applicant's claim for patentability, Newman et al. discloses, at Figs. 6 and 8, and column 9, lines 11-15, "The first facing sheet 72 is typically formed of glass fibers and supplied by a roll 74 or other suitable means, and a first cementitious slurry 76 is provided from a mixer 78 and deposited onto the surface of the facing sheet 72." However, the first facing sheet 72 is disclosed without having a nonwoven mat therewith. See column 1, lines 32 to 53, of Newman et al., which distinguishes facing sheet 72 of glass fibers from the facing sheet 10 having an open mesh glass screen 15 and a melt blown polymer web 20. Accordingly, the Newman et al. described, first facing sheet 72 typically formed of glass fibers and supplied by a roll 74 is a different facing sheet construction than the facing sheet 10 having an open mesh glass screen 15 and a melt blown polymer web 20. Further, the first facing sheet 72 of Newman et al. is different from Applicant's recited reinforcement fabric that is recited to comprise an open mesh and a nonwoven web described in Applicant's claim 17, sections (a) and (c).

The rejection, at page 7 further refers to the UK patent application together with Newman et al. by stating that "Hence Newman and Great Britain (UK) motivate one of ordinary skill in the art to use a mesh fabric united to nonwoven fabric in Canada's process so that the manufactured cement panel has improved strength and smooth surfaces." To avoid the rejection, Applicant's claim 17 at each of sections (b) and (c) recites a cement skin adjacent to an outer face to distinguish from the surfaces on fabrics of Newman et al. and the UK patent application, respectively. Further, the rejection at page 7 and at page 9 sets out a discussion of the UK disclosure with that of Canada. However, the salient feature of the UK application appears at page 2, lines 125 et seq., "[T]he plaster mass penetrates into the facing sheet to about line 6, so that the filament 2 is surrounded by the plaster and also a portion of the layer 4 is penetrated by the flowable plaster mash." At page 3, lines 27 et seq., "Since layer 4 on the side towards the fabric layer 2, 3 or the plaster core has a large pore size than on its outwardly facing surface, the flowable, water-containing plaster mash can penetrate relatively far into the layer 4. The extent of penetration is indicated by the lines 6 and 6' in the drawing." Accordingly, the lines 6 and 6'

are within respective layers 4, which prevents the plaster mash from forming a cement skin adjacent to the outer face, and the fabric embedded at a depth from the outer face.

Further, the UK published application discloses, at page 2, lines 14 et seq., "The nonwoven material is constructed with a varying density, namely with a lower density on the face towards the fabric and a higher density on the outer face so that relatively large pores are present on the side towards the plaster surface, these pores progressively decreasing in size towards the outer face of the non-woven material or tissue so that finally only fine pores remain, the sole purpose of which is to enable the water vapour evaporating as the plasterboard dries out to escape through these pores." Accordingly, the UK application considered as a whole requires a fabric as the outer surface of a plasterboard. Each of the UK application and the Canadian application discloses a fabric as the outer surface of a cementitious board, which can not combine to teach Applicant's method of forming a cement skin adjacent an outer face.

Riley is cited for disclosing fibers of a felt having a binder of polyvinyl alcohol adhesive, (pva) adhesive, with Shah et al disclosing that pva is a hydrophilic material. Riley does not further teach a combination of a cement skin adjacent to an outer face and a reinforcement fabric embedded at a depth from the outer face. Further, Applicant's claim 17 avoids a recital of pva as an adhesive disclosed by Riley and Shah et al. Further, claims 24 and 25 recite a spun bonded web that does not require a binder as taught by Riley.

Applicant's new claim 18 recites a preferred embodiment, wherein the layer of hydraulic cementitious material comprises a cementitious matrix material. An antecedent basis is provided by paragraphs [0021] and [0039].

Each of Applicant's new claims 19 and 25 recites a preferred embodiment, namely, forming the open mesh by encapsulating glass fibers with an alkali resistant material to provide encapsulated glass fibers, and joining the encapsulated glass fibers at intersection areas thereof within the open mesh. Claim 19 further recites a binder. An antecedent basis is provided by paragraphs [0022], [0027] and [0028].

Applicant's new claim 20 recites a preferred embodiment, which involves coextruding an alkali resistant material with glass fibers. Antecedent basis is provided by paragraphs [0023] and [0025].

Applicant's new claim 21 recites a preferred embodiment, which involves forming the open mesh by wrapping glass fibers with fibers of an alkali resistant material. An antecedent basis is provided by paragraphs [0026], [0027] and [0028].

Applicant's new claim 22 recites a preferred embodiment, which involves polypropylene fibers having thereon the hydrophilic material. Applicant's new claim 23 recites preferred embodiments of alternative alkali resistant polymer fibers. An antecedent basis is provided in paragraph [0030].

Each of Applicant's new claims 24 and 25 recites a preferred embodiment, which involves, forming the nonwoven web as either a spun bonded web of the fibers having the hydrophilic material thereon or a carded web of the fibers having the hydrophilic material thereon. An antecedent basis is provided by paragraph [0030]. The melt blown web of Newman et al. results in the microporous layer 220, Fig. 3. column 7, lines 12-34, which is disclosed by Newman et al. as forming a water resistant surface. The water resistant surface would be impenetrable by hydraulic cementitious material due to water in the hydraulic cementitious material. The Canadian application and the UK application do not disclose a particular method by which a reinforcement fabric is made, and thereby do not provide a basis to indicate that Applicant's claim 18 recitals are inherently or necessarily present in the UK application.

Applicant's new claim 26 recites a preferred embodiment involving, uniting the open mesh and the nonwoven web by heat fusing them together. An antecedent basis is provided by paragraph [0031].

Applicant's new claim 27 recites alternative preferred embodiments involving, uniting the open mesh and the nonwoven web by adhesive or stitching. An antecedent basis is provided by paragraph [0031].

Each of Applicant's new claims 28, 32 and 35 recites preferred embodiments of a method of applying materials, for which an antecedent basis is provided by paragraphs [0032], [0034], [0037] and [0039]. Similarly, Applicant's new claim 29 recites a preferred embodiment of a method of applying a slurry having cement powder, for which an antecedent basis is provided by paragraphs [0033], [0037] and [0039].

Each of Applicant's new claims 30, 33 and 36 recites a preferred embodiment of a method involving, depositing the layer of hydraulic cementitious material onto the reinforcement fabric thereby depositing one on the other; and compacting the layer of hydraulic cementitious material and the reinforcement fabric. An antecedent basis is provided by paragraph [0038] and Fig. 2.

Applicant's new claim 34 recites a preferred embodiment of a method involving, depositing the reinforcement fabric onto the layer of hydraulic cementitious material thereby depositing one on the other; and compacting the reinforcement fabric and the layer of hydraulic cementitious material. An antecedent basis is provided by paragraph [0039] and Fig. 2..

**Summary**

In view of the Amendment to the claims, and the Remarks supporting patentability, allowance is requested.

Respectfully submitted,

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